SECTION I—CLAIMS

Amendment to the Claims:

This listing of the claims will replace all prior versions and listings of claims in the application. Claims 1-66 remain canceled herein without prejudice. No claims are amended. No new claims are added. Claims 67-127 remain pending in the application.

Listing of Claims:

1-66. (Canceled).

67. (Previously presented) A tree data structure stored in a machine readable storage medium of a computer system to communicate information stored within the tree data structure in support of application(s) to execute on the computer system, the tree data structure comprising:

(a) a root node, wherein the root node comprises:

(i) a plurality of sequential keys, wherein each key comprises:

(1) a range for the key,

(2) a first value to define a lower bound of the range for the key, and

(3) a second value to define an upper bound of the range for the key,

(ii) wherein the ranges of the plurality of sequential keys are non-overlapping; and

(b) a pointer associated with the root node to identify a child node, the child node comprising a range outside the range of each key in the root node.

68. (Previously presented) The tree data structure of claim 67, wherein at least one of the keys of the root node further include a data element.

69. (Previously presented) The tree data structure of claim 67, wherein at least one of the keys of

the root node further includes a pointer to an associated data element.

70. (Previously presented) The tree data structure of claim 67, wherein one of the keys of the root node further includes a pointer to a set of data elements.

71. (Previously presented) The tree data structure of claim 70, wherein the set of data elements comprises a linked list.

72. (Previously presented) The tree data structure of claim 70, wherein each data element of the set is associated with the range of the one key.

73. (Previously presented) The tree data structure of claim 70, wherein one data element of the set is further associated with another one of the keys of the root node.

74. (Previously presented) The tree data structure of claim 70, wherein the set of data elements is prioritized.

75. (Previously presented) The tree data structure of claim 74, wherein a highest priority data element of the set of data elements corresponds to a data element having a longest length prefix.

76. (Previously presented) The tree data structure of claim 67, further comprising a temporary node including a number of keys that is less than a minimum number of keys.

77. (Previously presented) The tree data structure of claim 67, further comprising a temporary key, the temporary key having a range overlapping with the range of at least one of the keys in the root node.

78. (Previously presented) The tree data structure of claim 67, wherein the range of the child node is between the ranges of two sequential keys.

79. (Previously presented) The tree data structure of claim 67, wherein the range of the child node is beyond the range of an end key of the number of keys.

80. (Previously presented) The tree data structure of claim 67, wherein the range of each of the keys correspond to a range of network addresses.

81. (Previously presented) The tree data structure of claim 67, wherein the root node and the child node comprise a B-Tree data structure.

82. (Previously presented) The tree data structure of claim 67, wherein the machine readable storage medium comprises one of a memory device, an optical storage device, and a magnetic storage device.

83. (Previously presented) A method for storing a tree data structure in a machine readable storage medium of a computer system and communicating information stored within the tree data structure in support of application(s) executing on the computer system, the method comprising:

(a) storing a root node in the machine readable storage medium, wherein the root node comprises:

(i) a plurality of sequential keys, wherein each key comprises:

(1) a range for the key,

(2) a first value defining a lower bound of the range for the key, and

(3) a second value defining an upper bound of the range for the key,

(ii) wherein the ranges of the plurality of sequential keys are non-overlapping;

(b) storing a pointer associated with the root node in the machine readable storage medium, wherein the pointer identifies a child node, the child node comprising a range outside the range of each key in the root node; and

(c) storing the tree data structure in the machine readable storage medium wherein the tree data structure comprises the root node, and further comprises the pointer associated

with the root node.

84. (Previously presented) The method of claim 83, wherein at least one of the keys of the root node further includes a data element.

85. (Previously presented) The method of claim 83, wherein at least one of the keys of the root node further includes a pointer to an associated data element.

86. (Previously presented) The method of claim 83, wherein one of the keys of the root node further includes a pointer to a set of data elements.

87. (Previously presented) The method of claim 86, wherein the set of data elements comprises a linked list.

88. (Previously presented) The method of claim 86, wherein each data element of the set is associated with the range of the one key.

89. (Previously presented) The method of claim 86, wherein one data element of the set is further associated with another one of the keys of the root node.

90. (Previously presented) The method of claim 86, wherein the set of data elements is prioritized.

91. (Previously presented) The method of claim 90, wherein a highest priority data element of the set of data elements corresponds to a data element having a longest length prefix.

92. (Previously presented) The method of claim 83, further comprising storing in the machine readable storage medium a temporary node including a number of keys that is less than a minimum number of keys.

93. (Previously presented) The method of claim 83, further comprising storing in the machine readable storage medium a temporary key, the temporary key having a range overlapping with the range of at least one of the keys in the root node.

94. (Previously presented) The method of claim 83, wherein the range of the child node is between the ranges of two sequential keys.

95. (Previously presented) The method of claim 83, wherein the range of the child node is beyond the range of an end key of the number of keys.

96. (Previously presented) The method of claim 83, wherein the plurality of sequential keys are stored in contiguous locations of the machine readable storage medium.

97. (Previously presented) A computer apparatus comprising:

(a) a machine readable storage medium;

(b) an application to execute, wherein the application is stored in the machine readable storage medium; and

(c) a tree data structure stored within the machine readable storage medium, wherein the tree data structure to communicate information stored within the tree data structure to the application, and wherein the tree data structure comprises:

(i) a root node, wherein the root node comprises a plurality of sequential keys, wherein each key comprises:

(1) a range for the key,

(2) a first value to define a lower bound of the range for the key, and

(3) a second value to define an upper bound of the range for the key,

(ii) wherein the ranges of the plurality of sequential keys are non-overlapping; and

(iii) wherein the tree data structure further comprises a pointer associated with the root node to identify a child node, the child node comprising a range outside the range of each key in the root node.

98. (Previously presented) The computer apparatus of claim 97, wherein at least one of the keys

of the root node further includes a data element.

99. (Previously presented) The computer apparatus of claim 97, wherein at least one of the keys of the root node further includes a pointer to an associated data element.

100. (Previously presented) The computer apparatus of claim 97, wherein one of the keys of the root node further includes a pointer to a set of data elements.

101. (Previously presented) The computer apparatus of claim 100, wherein the set of data elements comprises a linked list.

102. (Previously presented) The computer apparatus of claim 100, wherein each data element of the set is associated with the range of the one key.

103. (Previously presented) The computer apparatus of claim 100, wherein one data element of the set is further associated with another one of the keys of the root node.

104. (Previously presented) The computer apparatus of claim 100, wherein the set of data elements is prioritized.

105. (Previously presented) The computer apparatus of claim 104, wherein a highest priority data element of the set of data elements corresponds to a data element having a longest length prefix.

106. (Previously presented) The computer apparatus of claim 97, further comprising a temporary node stored in the machine readable storage medium, the temporary node including a number of keys that is less than a minimum number of keys.

107. (Previously presented) The computer apparatus of claim 97, further comprising a temporary key stored in the machine readable storage medium, the temporary key having a range overlapping with the range of at least one of the keys in the root node.

108. (Previously presented) The computer apparatus of claim 97, wherein the range of the child

node is between the ranges of two sequential keys.

109. (Previously presented) The computer apparatus of claim 97, wherein the range of the child node is beyond the range of an end key of the number of keys.

110. (Previously presented) The computer apparatus of claim 97, further comprising a processing device coupled with the machine readable storage medium.

111. (Previously presented) The computer apparatus of claim 110, wherein the processing device includes logic to generate the tree data structure.

112. (Previously presented) The computer apparatus of claim 110, further comprising a set of instructions stored in the machine readable storage medium that, when executed on the processing device, generate the tree data structure in the machine readable storage medium.

113. (Previously presented) The computer apparatus of claim 110, wherein the processing device includes a set of instructions stored thereon that, when executed on the processing device, generate the tree data structure in the machine readable storage medium.

114. (Previously presented) A machine readable storage medium comprising content which, when executed, causes a computing system to process a tree data structure including information to support an application to execute on the computer system, the tree data structure comprising:

(a) a root node, wherein the root node comprises:

(i) a plurality of sequential keys, wherein each key comprises:

(1) a range for the key,

(2) a first value to define a lower bound of the range for the key, and

(3) a second value to define an upper bound of the range for the key,

(ii) wherein the ranges of the plurality of sequential keys are non-overlapping; and

(b) a pointer associated with the root node to identify a child node, the child node comprising a range outside the range of each key in the root node.

115. (Previously presented) The machine readable storage medium of claim 114, wherein at least one of the keys of the root node further includes a data element.

116. (Previously presented) The machine readable storage medium of claim 114, wherein at least one of the keys of the root node further includes a pointer to an associated data element.

117. (Previously presented) The machine readable storage medium of claim 114, wherein one of the keys of the root node includes a pointer to a set of data elements.

118. (Previously presented) The machine readable storage medium of claim 117, wherein the set of data elements comprises a linked list.

119. (Previously presented) The machine readable storage medium of claim 117, wherein each data element of the set is associated with the range of the one key.

120. (Previously presented) The machine readable storage medium of claim 117, wherein one data element of the set is further associated with another one of the keys of the root node.

121. (Previously presented) The machine readable storage medium of claim 117, wherein the set of data elements is prioritized.

122. (Previously presented) The machine readable storage medium of claim 121, wherein a highest priority data element of the set of data elements corresponds to a data element having a longest length prefix.

123. (Previously presented) The machine readable storage medium of claim 114, wherein the content, when accessed, further causes the machine to store in the machine readable storage medium a temporary node including a number of keys that is less than a

minimum number of keys.

124. (Previously presented) The machine readable storage medium of claim 114, wherein the content, when accessed, further causes the machine to store in the machine readable storage medium a temporary key, the temporary key having a range overlapping with the range of at least one of the keys in the root node.

125. (Previously presented) The machine readable storage medium of claim 114, wherein the range of the child node is between the ranges of two sequential keys.

126. (Previously presented) The machine readable storage medium of claim 114, wherein the range of the child node is beyond the range of an end key of the number of keys.

127. (Previously presented) The machine readable storage medium of claim 114, wherein the number of sequential keys are stored in contiguous locations of the machine readable storage medium.